

Work Order ID 60820

Friday, July 23, 2010 10:27:38 AM



Page 1

Item ID: D350-748-201

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Installation, High Aft

Start Date: 7/23/2010 Start Qty: 1.00

Cust Item ID:

Required Date: 8/16/2010 Req'd Qty: 1.00

Customer:

Reference:

Approvals: Process Plan:

Date: 10-7-23

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D350-748-241	Rev E								

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile & type labels per PPPD350-748-201

CHG001

5/10/02/23

10-7-23

110

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D350-748-241 using CNC bender program D350A and Folio FT

IX

MB 10-08-17

120

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

Quality Control

1

1005-10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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QC: Date: SPC (Y/N): Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

130

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1-Drill Tube as per Dwg D350-748-241 Using DT8876 Drill Jigs,
Set-up drill table as per QSI 010

2-Deburr

3-Engrave Part # and Batch # as per Dwg D350-748-241

4-Remove all marks from tube within limits of D350-748-241

5- Apply a light coat of LPS3 on the interior of tube

Batch: 109956

140

QC6- Inspect dimensions to drawing

0.00



QC

Memo

0.00

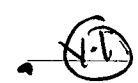
Quality Control

MB 10-08-18

Awm 10-08-18

Plb ->

8/10/08/19



Dart Aerospace Ltd

W/O: 60820		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
10/01/19	#110.5 110	ADD step to stress relief (steel) per AS7.10 Before step 920 . Done Per W/O 60822				1/1008/19	S. 10/01/19	
10-8-19	#110.5	Stress Relief Per AS7.010 Start - 1130AM stop - 330PM Temp - 375°F		10-8-17		1/1008/19	S. 10/01/19	

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4.2.3.12 Slide mandrel on top of both V-blocks and through bracket.

4.2.3.13 Tighten both nuts in an equal manner so that there is no play/movement in the mandrel.

4.2.3.14 Place buggy in proper orientation per bender folio.

REFERENCE ONLY

4.3 CROSSTUBE STRESS RELIEF (STEEL)

4.3.1 Stress relief shall be performed as soon as possible after bending:

4.3.1.1 Place Crosstubes in the oven vertically (as installed on the aircraft)

4.3.1.2 Heat crosstubes at 375 deg F for 4 hours

4.3.1.3 Allow to cool at room temperature

4.4 DT8577A TABLE SETUP FOR ASSEMBLY

4.4.1 Remove all bolts (2 per support) in both support stands.

4.4.2 Remove both support stands from previous location and place in proper hole location using the hole location chart for DT8577A.

4.4.3 Ensure cuff supports provide stability for crosstube during assembly in proper hole location.

4.4.4 Tighten all bolts (2 per support).

4.4.5 Make sure that painted supports are used for Support/Abrasion Strip installation.

4.4.6 Use proper support locating jigs for correct crosstubes. Check with blueprints for correct angles needed.

4.4.7 Use correct Abrasion strip locating tools for correct crosstubes.

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Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150 Outsource3 Outsource process - Cad plate	Outsource process-Cadplate per QSI017 4.1.9.1 Memo Issue P/O: <u>12435</u> Stress relief at 375° for 5 hours Magnetic Particle Inspect per ASTM E1444 Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possible Supplier: Southwest United Industries Ensure Certificate of Conformity is attached	0.00 0.00							<u>CZ 10/8/17</u> ①
160 Packaging Packaging	Receive & Inspect for Damage & Mat'l Certs Memo Ensure certificate of conformity is attached	0.00 0.00							<u>P 10/9/17</u> ①
170 QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00							<u>mm 10 09 20</u> ①

PTO

Dart Aerospace Ltd

W/O: 60820		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
10/9/14	175	NDT per QSTO38 before & after Load Testing per eng. this time only P/O: 12557	CZ	10/9/14	①	<i>[Signature]</i> 10-9-14	
		rec'd + inspect					
			<i>[Signature]</i>	10/9/14	1		

Part No: D350-748-201 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Customer:

Reference:

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 	SprayPaint	0.00							
SprayPaint	Memo	0.00							
Spray Painting	1-Prime inside crosstube as per QSI 005 4.2 2-Paint Outside of Tube as per Dart QSI 005 4.2								
190 	QC14- Inspect Spray Paint	0.00							
QC	Memo	0.00							
Quality Control	Then, Wrap in plastic bag to protect from scratches								
200 	Crosstubes	0.00							
Crosstubes	Memo	0.00							
Crosstubes	1-Install Ground wire Insert, then insert screw and washer 2-Install Abrasion strips as per Dwg D350-748-241 & QSI 035. 3-Install supports Using Dt8876 as per Dwg D350-748-241, Torque to 60-80 IN-LBS								

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Required Date: 8/16/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

S 10/6/22

⑩

220

Pick Kit

0.00



Packaging

Memo

0.00

Packaging

P 10/9/23 ①

230

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

S 10/6/13

⑩

W/O:		WORK ORDER CHANGES					
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Cust Item ID:

Required Date: 8/16/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240		0.00							
	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPPD350-748-201								
	Location: 109								
	PPP Rev: A								
250		0.00							
	QC21- Final Inspection - Work Order Release	0.00							
QC	Memo	0.00							
Quality Control									

10/9/23

10/09/24

MF

10-9-23

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Picklist Print

Friday, July 23, 2010 10:27:43 AM

Page 1

Work Order ID: 60820

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev: A New Issue 06-07-05 JLM
 IPP Rev: B Update qty of MS21042L5 06-09-12 KJ
 IPP Rev C Combined manufacturing 08.04.02 EC verified by: DD
 IPP Rev:D 08-06-24 revD as per dwg DD verified by:EC
 IPP Rev: E 08.12.11 Step17 was step 21 KJ Verified by:

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D350-748-241 TRN		Manufactured	No			110	Each	0.0000	1	1			
Crosstube Turning Detail													
ALS4-1032-225		Purchased	No			200	Each	6,043.000	1	1			
Insert													
<div> <div>Location</div> <div>PK011</div> <div>110768</div> </div> <div> <div>Loc Qty</div> <div>6043</div> <div>6043</div> </div> <div> <div>Loc Code</div> <div></div> <div></div> </div>													
AN960JD10	NAS1149D0363J	Purchased	No			200	Each	0.0000	1	1			
Washer													
D2856-400		Manufactured	No			200	f	361.0188	1.181	1.243158			
Abraison Strip													
<div> <div>Location</div> <div>ST403</div> <div>56626</div> <div>59920</div> </div> <div> <div>Loc Qty</div> <div>361.0188421</div> <div>145.018842</div> <div>216</div> </div> <div> <div>Loc Code</div> <div></div> <div></div> <div></div> </div>													

1- cut as per dwg D2856

B-58589 MB 10-08-17

ml 10-09-21

ml 10-09-21

ml 10-09-21

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Work Order ID: 60820

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

D3502-1

Manufactured No

200

Each

56.0000

2

2



Support



ml 10.09.21

Location

Loc Qty

Loc Code

ST066

56

47120

1

50287

38

52903

17

MS21920-20

Purchased

No

200

Each

103.0000

2

2



Clamp (per MIL-DTL-8783C)



ml 10.09.21

Location

Loc Qty

Loc Code

LG

103

112624

18

114687

35

114779

24

115057

26

MS27039-1-10

Purchased

No

200

Each

133.0000

1

1



Screw



ml 10.09.21

Location

Loc Qty

Loc Code

ST291

133

112794

33

112940

100

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Shop Packet Print

Page 2

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Parent Item Name: Crosstube Installation, High Aft

Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

AN4-41A
Bolt

Purchased No

220 Each

290.0000

8 1 8

Location

Loc Qty

Loc Code

ST360

290

111424

4

113359

86

114941

100

115108

100

AN4-6A
Bolt

Purchased No

220 Each

1,243.000

16 16

Location

Loc Qty

Loc Code

ST356

1243

112933

96

113149

344

114523

2

114615

1

114941

500

115108

300

AN5-32A
Bolt

Purchased No

220 Each

228.0000

4 4

Location

Loc Qty

Loc Code

ST340

228

113121

4

114056

74

114405

50

115016

50

115108

50

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Shop Packet Print

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Dart Aerospace Ltd

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Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

AN960JD416 NAS1149D0463J Purchased No

220

Each

0.0000

32

32

Washer

AN960JD516 NAS1149D0563J Purchased No

220

Each

0.0000

8

8

Washer

D3500-1 Manufactured No

220

Each

42.0000

4

4

Saddle

Location

Loc Qty

Loc Code

ST424

26

59120

8

59422

18

ST425

16

55605

16

D3501-1

Manufactured No

220

Each

406.0000

16

16

Bushing

Location

Loc Qty

Loc Code

ST066

406

45402

15

45918

112

48268

179

53779

100

M115622

M114742

61200

6/10/23

53779

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Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

MS21042L4

Purchased

No

220

Each

3,897.000

24

24



Nut



Le

Location

Loc Qty

Loc Code

ST300

3897

113422

68

114523

28

114718

23

114784

1778

115108

2000

MS21042L5

Purchased

No

220

Each

796.0000

4

4



Nut



7/23/10

Location

Loc Qty

Loc Code

ST139

296

114813

296

ST300

500

115156

500

7/23/10

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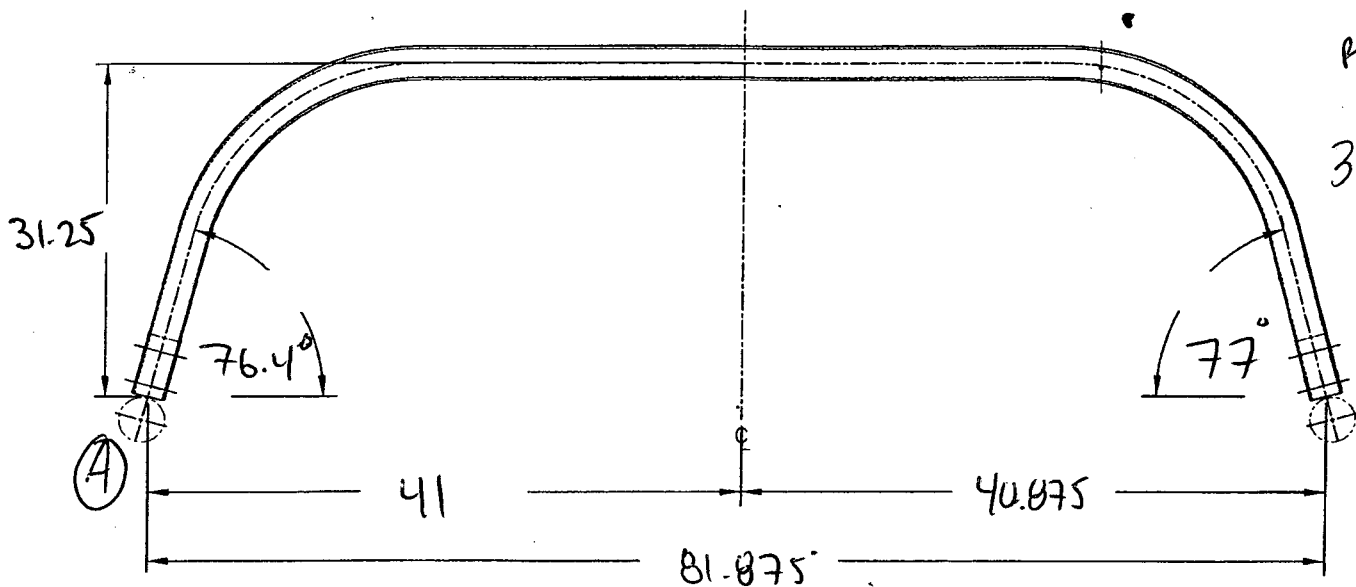
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DART AEROSPACE LTD		Work Order:	60820
Description: Crosstube High Aft (AS350/355)		Part Number:	D350-748-201
Inspection Dwg: D350-748-241		Rev: D E	Page 1 of 1

E 10.08.17

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06



Comments
Tube sits flat. L meter reaches only 6° twist @ center.

QC15 Inspection	
Date	10.08.18

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	

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Item	Qty -241	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6018-125	CROSSTUBE
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6018-125
FINISHED LENGTH = 122.700±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 29.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 T-READS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHO
UNCLASIFIED COPY
SUBJECT TO A MFR. SPEC.
WITHOUT NOTICE
WORK ORDER
NO. 00820
10-7-23

RELEASED
2009-10-29
MD

E	REVISE GENERAL NOTES; UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C6-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>Q</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	<i>Q</i>	DRAWING NO.	REV. E
MFG. APPR.	<i>DS</i>	D350-748-241	SHEET 1 OF 4
APPROVED	<i>MD</i>	TITLE	SCALE
DE APPR.	<i>MD</i>	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	09.09.30	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

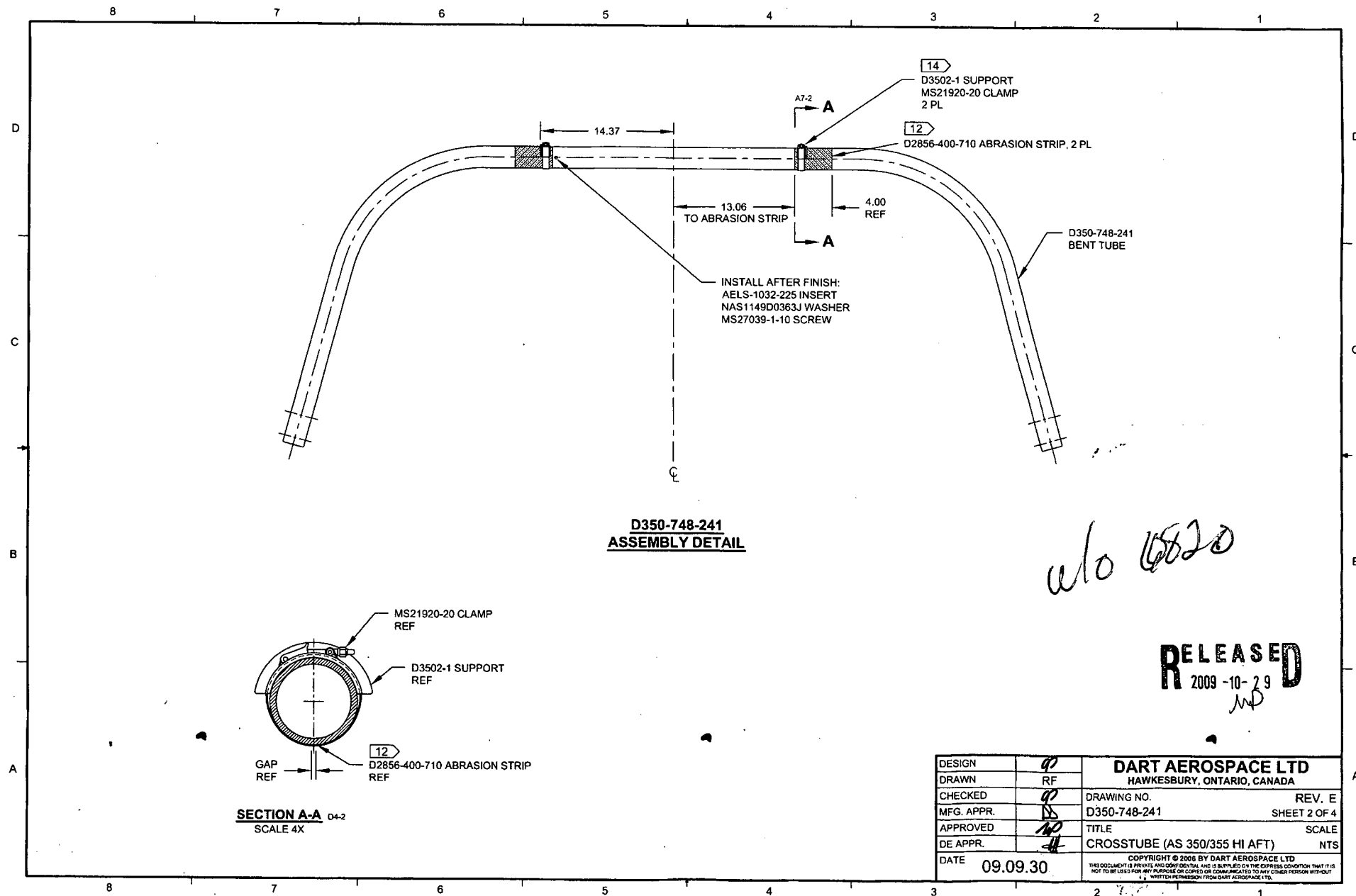
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN	9P	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9P	DRAWING NO.	REV. E
MFG. APPR.	18	D350-748-241	SHEET 2 OF 4
APPROVED	14	TITLE	SCALE
DE APPR.	11	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	09.09.30	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

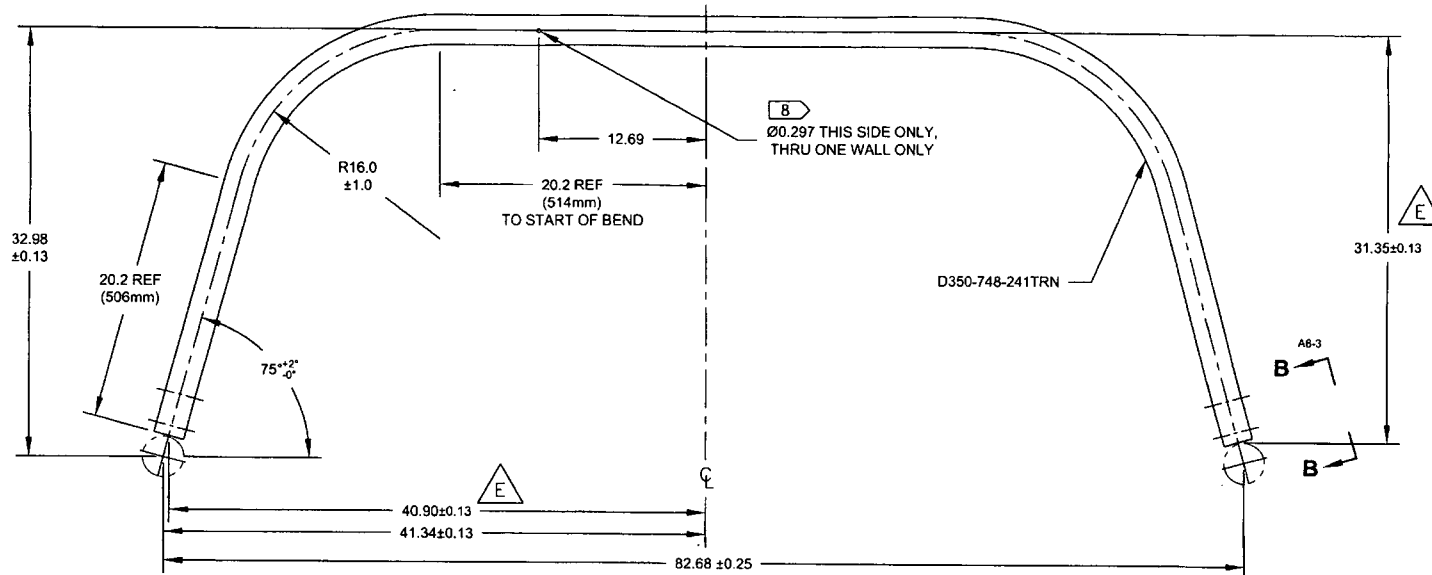
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

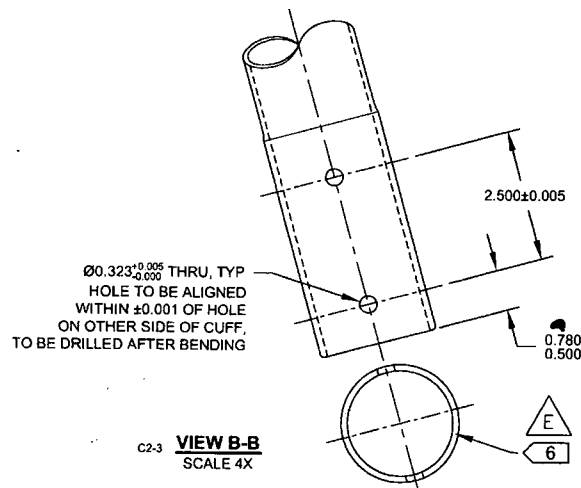
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



D350-748-241
BENDING AND DRILLING DETAIL 10



w/o 60820

RELEASED
2009-10-29
MD

DESIGN	90	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	90	DRAWING NO.	REV. E
MFG. APPR.	90	D350-748-241	SHEET 3 OF 4
APPROVED	90	TITLE	SCALE
DE APPR.	90	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

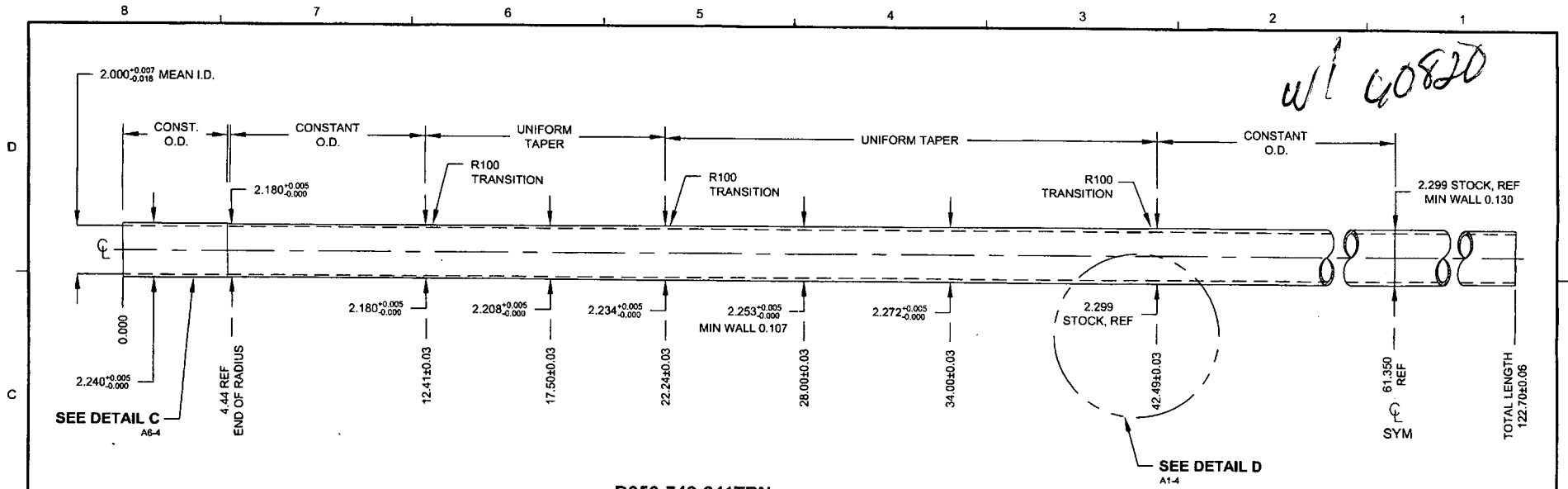
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

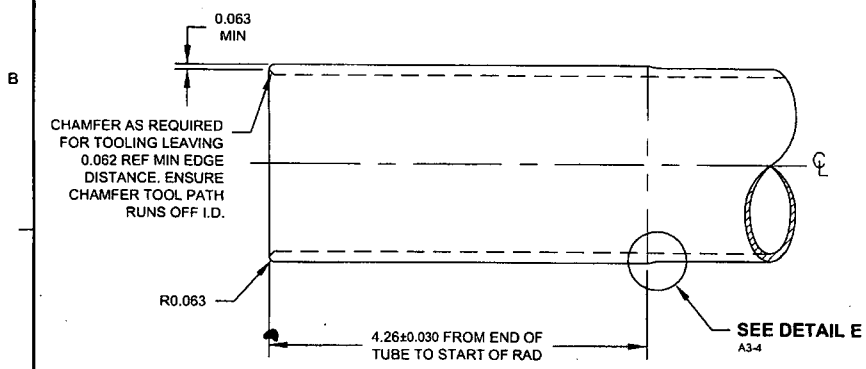
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

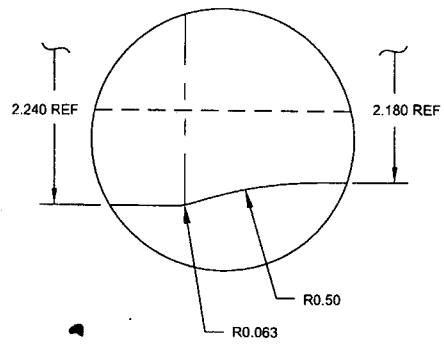
W/ 60820



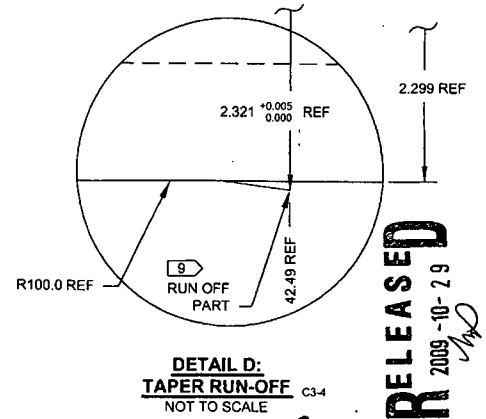
**D350-748-241TRN
TURNING DETAIL**



**DETAIL C:
CROSSTUBE CUFF** C8-4
SCALE 3X



**DETAIL E:
CUFF TRANSITION** A5-4
NOT TO SCALE



DESIGN	90	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	90	DRAWING NO.	REV. E
MFG. APPR.	90	D350-748-241	SHEET 4 OF 4
APPROVED	90	TITLE	SCALE
DE APPR.	90	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	09.09.30	<small>COPYRIGHT © 2008 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

RELEASED
 2009-10-29

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Sep-03-2010

**CONSIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St
Hawksbury, ON K6A 1K7**

**W/O #: 97983
INVOICE #: 51085**

**CONTRACT OR
PURCHASE ORDER # PO12435**

DESCRIPTION: SKID	QTY	1
P/N # D350-748-201	S/N # B60820	

**STRESS REFLIF BAKE @ 375 DEG. BAKE HEAT CHART #10-907.
MPI INSPECTED IAW ASTM-E-1444. CADMIUM PLATED IAW AMS-
QQ-P-416C, TYPE 2 YELLOW, CLASS 1. BAKE HEAT CHART #10-923.**

**CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.**

Approved Inspector:



A large, stylized handwritten signature in black ink.



LIQUID PENETRANT TEST REPORT

P- 15189

CLIENT DART Aerospace DATE Sept 13-2010 PAGE 1 OF 1
ATTENTION LINDA/CHANTEL ACUREN JOB No. 100-10-0838
ADDRESS 1270 ADELPHI STREET. PO/WO No. 12435
HAWKESBURY ON WORK LOCATION HAWKESBURY PLANT
KOH 1KT ACCEPTANCE STD. ASTM 1417 REV./DATE 2007
PROJECT F.P.I. on CROSS TUBES
ITEM(S) EXAMINED 11

JOB DESCRIPTION PROCEDURE No. LT-0002 REV./DATE --- TECHNIQUE No. LT-0002 REV./DATE ---
PART No. --- MATERIAL STEEL THICKNESS ---
SCOPE WET FLOWESCENT LIQUID PENETRANT
INSPECTION CARRIED OUT 100% EXTERNAL.

TEST DETAILS
METHOD ☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED
FAMILY BRAND MAGNAFLUX BLACK LIGHT S/N 16459 ☐ OUTPUT > 1000 μ W/cm² ☐ AMBIENT < 2 fc
PENETRANT 2LG7 MINIMUM DWELL TIME 45 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
PENETRANT-REMOVER H2O MINIMUM DRY TIME >10 MIN. OTHER LAB. NO
DEVELOPER SKD 52 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N 1098966 CAL DUE DATE Oct 7-1
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY 2010

TEST SURFACE
SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL
SURFACE TEMPERATURE ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/50°F ☒ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

1 - CROSS TUBE W.O. 59805 ✓
1 - CROSS TUBE W.O. 60815 ✓
1 - CROSS TUBE W.O. 59907 ✓
1 - CROSS TUBE W.O. 60816 ✓
1 - CROSS TUBE W.O. 59905 ✓
1 - CROSS TUBE W.O. 60820 ✓
1 - CROSS TUBE W.O. 60821 ✓
1 - CROSS TUBE W.O. 60822 ✓
1 - CROSS TUBE W.O. 60817 ✓
1 - CROSS TUBE W.O. 60818 ✓
1 - CROSS TUBE W.O. 59904 ✓
1 - CROSS TUBE W.O. 59906 ✓

- EXAMINATION WAS
COMPLETED
PRIOR TO DEFLECTION
TESTING

mm 10-09-20

Scope of Services
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.
Standard of Care
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES
CLIENT REPRESENTATIVE Zan Tiffey SIGNATURE [Signature] DTR # E63387
TECHNICIAN (SIGNATURE): [Signature] REPORT REVIEWED BY:
NAME (PRINT): Mike Johnston NAME INITIALS
1ST TECHNICIAN 2ND TECHNICIAN
CGSB LEVEL 3 SNT LEVEL --- CGSB LEVEL --- SNT LEVEL ---
CGSB REG. No 6606 CGSB REG. No ---



LIQUID PENETRANT TEST REPORT

P- 15191

CLIENT	<u>DACT Aerospace</u>	DATE	<u>SEP 13-2010</u>	PAGE	<u>1</u>	OF	<u>1</u>
ATTENTION	<u>LINDA/CHANTEL</u>	ACUREN JOB NO.	<u>188-10-0838</u>	TIME	AM <input checked="" type="checkbox"/>	PM <input type="checkbox"/>	
ADDRESS	<u>1270 ABERDEEN STREET</u>	PO/NO.	<u>12435</u>	WORK LOCATION	<u>HAWKESBURY PLANT</u>		
	<u>HAWKESBURY, ON.</u>	ACCEPTANCE STD.	<u>ASTM 1417</u>	REV./DATE	<u>2007</u>		
PROJECT	<u>KOH 1K7</u>						
ITEM(S) EXAMINED	<u>F.P.I. ON CROSS TUBES</u>						
	<u>12</u>						

JOB DESCRIPTION	PROCEDURE NO. <u>LT-0002</u>	REV./DATE	<u>-</u>	TECHNIQUE NO. <u>LT-0002</u>	REV./DATE	<u>-</u>
PART NO.	<u>-</u>	MATERIAL	<u>STEEL</u>	THICKNESS	<u>-</u>	
SCOPE	<u>WET FLOUORESCENT LIQUID PENETRANT INSPECTION CARRIED OUT 100% EXTERNAL</u>					

TEST DETAILS								
METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED			
FAMILY BRAND	<u>MAGNAFLUX</u>		BLACK LIGHT S/N	<u>16459</u>	<input type="checkbox"/> OUTPUT > 1000 μ W/cm ²	<input type="checkbox"/> AMBIENT < 2 fc		
PENETRANT	<u>2L07</u>	MINIMUM DWELL TIME	<u>45</u>	MIN.	LIGHTING EQUIP.	<input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE		
PENETRANT REMOVER	<u>H2O</u>	MINIMUM DRY TIME	<u>>10</u>	MIN.	OTHER	<u>LABINO</u>		
DEVELOPER	<u>SKD-52</u>	MINIMUM DWELL TIME	<u>10</u>	MIN.	LIGHT METER S/N	<u>1098866</u>	CAL DUE DATE	<u>OCT 19 2010</u>
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY					

TEST SURFACE					
SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input checked="" type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F	<input type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

RESULTS- (<input type="checkbox"/> METRIC <input type="checkbox"/> IMPERIAL)																																		
<table><tr><td>1</td><td>-CROSSTUBE.W.O. 59905</td><td>✓</td></tr><tr><td>1</td><td>-CROSSTUBE.W.O. 60815</td><td>✓</td></tr><tr><td>1</td><td>-CROSSTUBE.W.O. 59907</td><td>✓</td></tr><tr><td>1</td><td>-CROSSTUBE.W.O. 60816</td><td>✓</td></tr><tr><td>1</td><td>-CROSSTUBE.W.O. 60820</td><td>✓</td></tr><tr><td>1</td><td>-CROSSTUBE.W.O. 60821</td><td>✓</td></tr><tr><td>1</td><td>-CROSSTUBE.W.O. 60822</td><td>✓</td></tr><tr><td>1</td><td>-CROSSTUBE.W.O. 60817</td><td>✓</td></tr><tr><td>1</td><td>-CROSSTUBE.W.O. 60818</td><td>✓</td></tr><tr><td>1</td><td>-CROSSTUBE.W.O. 59904</td><td>✓</td></tr><tr><td>1</td><td>-CROSSTUBE.W.O. 59906</td><td>✓</td></tr></table>	1	-CROSSTUBE.W.O. 59905	✓	1	-CROSSTUBE.W.O. 60815	✓	1	-CROSSTUBE.W.O. 59907	✓	1	-CROSSTUBE.W.O. 60816	✓	1	-CROSSTUBE.W.O. 60820	✓	1	-CROSSTUBE.W.O. 60821	✓	1	-CROSSTUBE.W.O. 60822	✓	1	-CROSSTUBE.W.O. 60817	✓	1	-CROSSTUBE.W.O. 60818	✓	1	-CROSSTUBE.W.O. 59904	✓	1	-CROSSTUBE.W.O. 59906	✓	<p>- EXAMINATION WAS COMPLETED</p> <p>* AFTER DEFLECTION</p> <p><u>TESTING</u></p> <p><u>MA 10-09-20</u></p>
1	-CROSSTUBE.W.O. 59905	✓																																
1	-CROSSTUBE.W.O. 60815	✓																																
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1	-CROSSTUBE.W.O. 59906	✓																																

Scope of Services
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Standard of Care
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES		
CLIENT REPRESENTATIVE	<u>[Signature]</u>	DTR # <u>E63387</u>
TECHNICIAN (SIGNATURE):	<u>[Signature]</u>	REPORT REVIEWED BY:
NAME (PRINT):	<u>Mike Johnston</u>	NAME INITIALS
	1 ST TECHNICIAN	2 ND TECHNICIAN
CGSB LEVEL	<u>II</u> SNT LEVEL	CGSB LEVEL SNT LEVEL
CGSB REG. NO.	<u>6606</u>	CGSB REG. NO.

REFERENCE ONLY**5.0 PARTS LIST**

Qty -101	Qty -201	Part Number	Description
X		D350-748-101	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD
	X	D350-748-201	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT
1		D350-748-141	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD
	1	D350-748-241	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT
*2	*2	D3502-1	SUPPORT
*2	*2	D2856-400-710	ABRASION STRIP
*1	*1	AELS-1032-225	INSERT
*2	*2	MS21920-20	CLAMP
*1	*1	MS27039-1-10	SCREW
*1	*1	AN960JD10	WASHER
4	4	D3500-1	SADDLE
16	16	D3501-1	BUSHING
16	16	AN4-6A	BOLT
8	8	AN4-41A	BOLT
4	4	AN5-32A	BOLT
32	32	AN960JD416	WASHER
8	8	AN960JD516	WASHER
24	24	MS21042L4	NUT (OR MS21042-4)
4	4	MS21042L5	NUT (OR MS21042-5)

* REFERENCE ONLY. PARTS ARE INCLUDED IN D350-748-141/241 ASSEMBLIES ABOVE

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Revision: **B**

Date: 07.06.15